

Four New Myrtaceae from Eastern Brazil

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ABSTRACT. *Myrcia clavija* Sobral, *Myrciaria pilosa* Sobral & Couto, *Plinia longiacuminata* Sobral, and *Plinia subavenia* Sobral are newly described and illustrated. *Myrcia clavija*, from montane forests of Minas Gerais, is related to *M. hexasticha* Kiaerskou, from which it differs by its 6-verticillate leaves, persistent bracteoles, and aristate calyx lobes. *Myrciaria pilosa*, from rocky fields of Bahia and forests of Minas Gerais, is close to *M. floribunda* (H. West ex Willdenow) O. Berg, differing by the pubescence of its leaves and flowers. *Plinia longiacuminata* and *P. subavenia* were collected from rainforests in coastal Bahia and Espírito Santo; the former is close to *P. edulis* (Vellozo) Sobral, differing from it by glabrous twigs and smaller leaves, and the latter is close to *P. involucrata* (O. Berg) McVaugh, from which it is distinguished by the glabrescence of leaves and fruits and by blades with the midvein adaxially sulcate. Comments on the conservation status of the species are also provided.

RESUMO. *Myrcia clavija* Sobral, *Myrciaria pilosa* Sobral & Couto, *Plinia longiacuminata* Sobral e *Plinia subavenia* Sobral são descritas como novas e ilustradas. *Myrcia clavija*, das florestas montanas de Minas Gerais, é próxima a *M. hexasticha* Kiaerskou, diferindo pelas folhas 6-verticiladas, bractéolas persistentes e lobos do cálice aristados. *Myrciaria pilosa*, dos campos rupestres da Bahia e florestas de Minas Gerais, é afim a *M. floribunda* (H. West ex Willdenow) O. Berg, da qual se distingue pelas folhas e flores pilosas. *Plinia longiacuminata* e *P. subavenia* foram coletadas na mata atlântica da Bahia e Espírito Santo; a primeira se assemelha a *P. edulis* (Vellozo) Sobral, diferindo pelos ramos glabros e folhas mais estreitas, e a segunda é próxima a *P. involucrata* (O. Berg) McVaugh, da qual se distingue pelas folhas e frutos glabrescentes e lâminas com nervura central sulcada na face adaxial. São apresentados comentários sobre o status de conservação das espécies descritas.

Key words: Brazil, IUCN Conservation Status, *Myrcia*, *Myrciaria*, Myrtaceae, *Plinia*.

The family Myrtaceae in Brazil is presently represented by about 1000 species distributed in 20 genera (Landrum & Kawasaki, 1997). While examining recent collections from the coastal Brazilian rainforest (mata atlântica) and the rocky fields of Bahia, several undescribed species came to our attention; they are here proposed as new.

The terminology used for reproductive structures is that of current use in recent taxonomic papers on the family (e.g., Landrum, 1986; Kawasaki, 1989; Proença, 1990; Landrum & Kawasaki, 1997; Landrum, 2003; Sobral, 2003; Holst & Kawasaki, 2004). Briggs and Johnson (1979) have proposed a detailed terminology of inflorescences; nevertheless, although useful for phylogenetic approaches (e.g., Wilson et al., 2001), its specificity may make the terminology “only understandable to committed specialists” (Snow et al., 2003: 13).

***Myrcia clavija* Sobral, sp. nov.** TYPE: Brazil. Minas Gerais: Descoberto, Res. Biol. Represa do Gramá, 15 June 2001, R. Forzza, B. Franco, P. Faria & L. Meireles 2193 (holotype, CESJ; isotype, RB). Figures 1A, 2.

Haec species *Myrciae hexastichae* Kiaerskou proxima, a qua foliis 6-verticillatis, bracteolis persistentibus et lobis calycinis longe aristatis distincta est.

Treelet 3–8 m high. Twigs and inflorescences covered with brown-tinged trichomes to 0.3–1 mm. Leaves verticillate, 6 at each node; petioles 3–7 × 1.2–3 mm. Blades narrowly oblong, 160–270 × 18–30 mm, discolored when dry; glandular dots less than 0.1 mm diam., scarcely visible on either surface even against light; apex acuminate to long-acuminate; base obtuse to cordate; midvein evident and salient on both sides; secondary veins in 40 to 60 pairs, evident and at least weakly salient on both sides; intersecondary

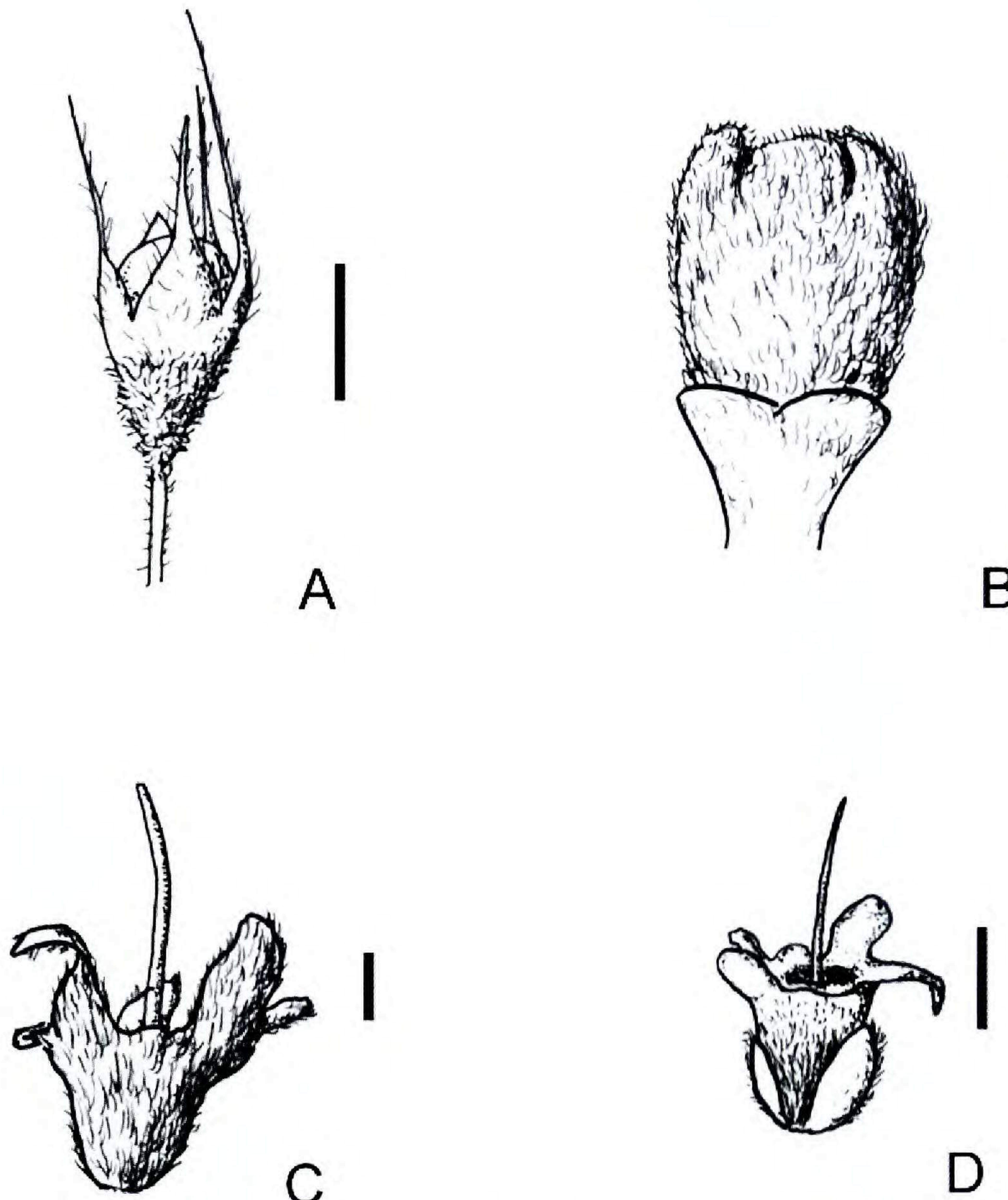


Figure 1. Schematic drawings.—A. *Myrcia clarija* Sobral: flower bud (*Faria et al.* 118, CESJ).—B. *Myrciaria pilosa* Sobral & Couto: flower bud (*França et al.* 4169, BHCB).—C. *Plinia longiacuminata* Sobral: old flower; bracteoles not represented (*Carvalho et al.* 3451, CEPEC).—D. *Plinia subavenia* Sobral: old flower (*Sant'Ana et al.* 365, holotype, CEPEC). Scales = 2 mm.

veins evident, slightly thinner than the secondary ones; intramarginal vein (sensu Carr et al., 1986: 58) 0.8–1 mm from the slightly revolute margin. Inflorescences paniculiform, occasionally with linear basal bracts to 15×2 mm, 50- to 100-flowered, terminal or lateral at defoliated nodes, up to 6 at a node, the main floral axis $100\text{--}230 \times 1.2\text{--}1.5$ mm, the secondary axes to 50 mm and occasional tertiary ones to 20 mm; bracts at the base of secondary axes linear, $4\text{--}15 \times 0.2\text{--}1.5$ mm; bracts at the base of flowers linear, to 2.5×0.2 mm; flowers sessile (sometimes several of them falling before anthesis along secondary or tertiary axes and so simulating long-pedunculate flowers); bracteoles triangular, just above the bracts, to 0.3×0.1 mm, persisting after anthesis. Flower buds obovate, to 3×2 mm, the ovary visibly distinct from the calyx, densely covered by brown-tinged trichomes to 0.3 mm; calyx lobes 5, triangular, reflexed at anthesis, unequal, $1\text{--}1.5 \times 1\text{--}2$ mm, at least 4 of them bearing a 1.5–2 mm long arista that generally breaks at anthesis;

petals as far as observed 3, orbicular, concave, to 2×2.5 mm, glabrous or finely ciliate; stamens ca. 50, to 3 mm, the anthers globose, $0.2\text{--}0.3 \times 0.3$ mm, without evident glands; staminal ring 2.5–3 mm diam.; style 5 mm, the stigma punctiform and minutely papillose; calyx tube 0.8–1 mm deep; ovary bilocular with 2 ovules per locule. Fruits globose or slightly oblate, $10 \times 10\text{--}12$ mm, black when ripe, with 1 or 2 seeds $9\text{--}10 \times 7\text{--}8$ mm, with brown shining testa; embryo reniform, with well-developed hypocotyl and cotyledons.

Habitat, distribution, and phenology. *Myrcia clarija* is an understory tree to 8 m from ombrophilous montane forests of southeastern Minas Gerais, at altitudes of approximately 1000 m; until now it has been collected only in the municipality of Descoberto (about $21^{\circ}30'S$, $43^{\circ}W$), at the Represa do Gramá biological reserve, a forest reserve with 263.8 ha (Neto et al., 2004). Flowering material was collected



Figure 2. Holotype specimen of *Myrcia clavija* Sobral (Forzza et al. 2193, CESJ).

in April and June, and fruiting material in September and November.

Conservation status. The presently known range of this species may be indicative of its narrow endemism. Considering the presently available information,

Myrcia clavija can be considered an endangered species (category EN) because it fits IUCN's criteria (IUCN, 2001) B1 ab(iii), that is, it has an estimated range of less than 5000 km² (B1), it grows in a severely fragmented habitat and is known from less than five localities (a), and its habitat presents

a continuing decline in its extension (b(iii)), since although the species was collected in a preservation reserve, the neighboring areas are being intensely altered by anthropic activities such as farming.

Affinities. *Myrcia clavija* is apparently related to *M. hexasticha* Kiaerskou (for description see Kiaerskou, 1893: 72), collected along the coastal Brazilian Atlantic forest in the nearby state of Rio de Janeiro. The two species can be distinguished by the characters in the following key couplet:

- 1a. Branches with 3-verticillate leaves; bracteoles deciduous at anthesis; calyx lobes rounded *Myrcia hexasticha*
1b. Branches with 6-verticillate leaves; bracteoles persistent after anthesis; calyx lobes aristate *Myrcia clavija*

Etymology. The epithet alludes to the resemblance of the leaves to some *Clavija* Ruiz & Pavón species (Theophrastaceae); indeed, during the initial sorting of the extensive collections for the floristic study of Descoberto, this plant was initially filed under *Clavija*.

Paratypes. BRAZIL Minas Gerais: Descoberto, Res. Biol. Represa do Gramá, 15 Apr. 2000, P. C. Faria, P. C. Zampa, R. Magalhães, P. O. Costa, L. F. Fazza, L. D. Meireles & S. M. Verardo 118 (CESJ); 10 June 2000, F. Salimena, L. D. Meireles, P. C. Zampa, F. Magalhães, P. O. Costa & L. F. Fazza s.n. (CESJ 31191A); R. M. Castro, V. R. Almeida, P. C. Faria, B. Franco & L. Fernandes 658 (CESJ, RB); R. Forzza, V. R. Scalon, L. D. Meireles, L. Menim-Neto, V. R. Almeida & L. C. S. Assis 2219 (CESJ).

Myrciaria pilosa Sobral & Couto, sp. nov. TYPE: Brazil. Minas Gerais: Caratinga, Est. Biol. Caratinga, Mata do Jaó, 1 Dec. 2001, J. V. Gomes 721 (holotype, BHCB; isotypes, MBM, MO, RB). Figures 1B, 3.

Haec species *Myrciariae floribundae* (H. West ex Willdenow) O. Berg proxima, a qua foliis abaxialiter pilosis et floribus dense sericeis distincta est.

Shrub to small tree 1.5–5 m high; cortex smooth and gray, peeling (according to Harley 50471); twigs glabrous or with scattered gray trichomes to 0.2 mm. Leaves with petioles 4–9 × 0.5–0.8 mm, glabrous or with scattered trichomes similar to the twigs; blades elliptic to lanceolate, 40–110 × 15–40 mm, discolored, the adaxial face glabrous, drying dark green or olive-green, the abaxial surface cinereous, with erect or appressed trichomes to 0.3 mm, persisting in adult leaves; glandular dots not visible adaxially and sometimes visible abaxially, occasionally evident when examined against light, to 0.1 mm diam., in some cases with 2 distinct sizes, some with less than 0.1 mm diam. and others to 0.2 mm diam.; apex

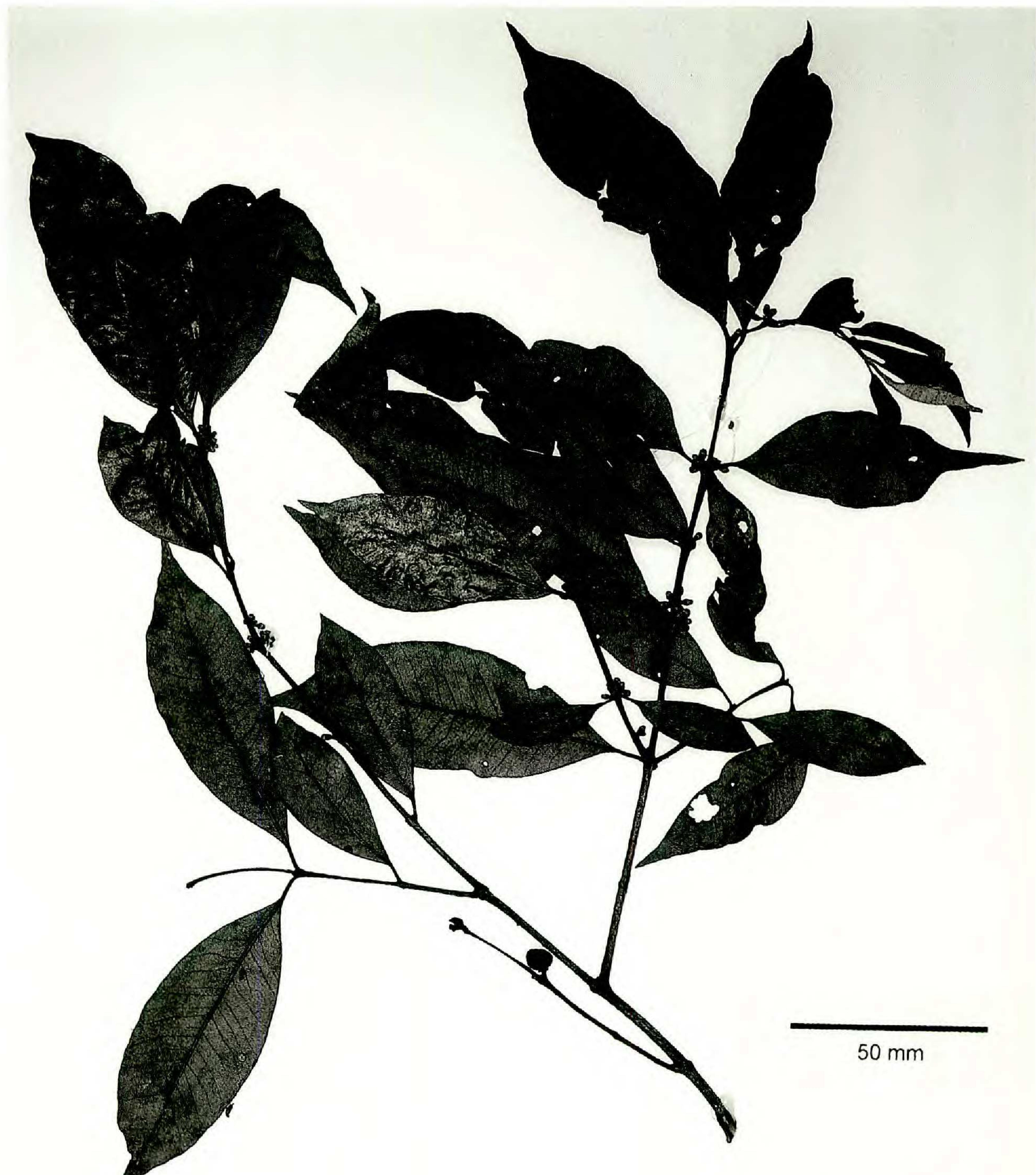
acuminate, sometimes the midvein excurrent for 0.5–1 mm; base cuneate; midvein sulcate adaxially and salient abaxially; secondary veins in 12 to 20 pairs, occasionally visible and salient on both sides; intra-marginal vein 0.5–0.8 mm from the slightly revolute margin. Inflorescences axillary or ramiflorous, 2- to 6-flowered, racemiform, the fertile axis 1.5–4 × 1 mm or occasionally absent; bracts ovate, 1–1.2 × 1 mm, glabrous or with gray trichomes to 0.2 mm; peduncles 1–2 × 1 mm, with trichomes 0.1–0.2 mm; bracteoles ovate, 0.8–1.2 × 1–1.5 mm, glabrous or sparsely pilose as the bracts. Flower buds obovate, 3–4 × 2.5–3 mm, entirely covered externally with whitened trichomes to 0.1 mm; calyx lobes 4, opening somewhat irregularly, 1–1.2 × 1–1.5 mm, glabrous within, pilose externally; petals rounded or obovate, 1.5–1.8 × 1.5 mm, ciliate; stamens ca. 70, 4–5 mm, the anthers globose, 0.2–0.3 × 0.2 mm, with 1 apical gland; style 7–8 mm, the stigma slightly capitate and papillose; calyx tube to 1 mm deep, glabrous; ovary 2-locular, with 2 ovules per locule. Fruits globose, to 10 mm diam., orange-colored or black when ripe, with a circular scar left by the deciduous calyx tube, 1-seeded; seeds reniform, 7 × 6 mm; embryo with cotyledons fused and without evident hypocotyl.

Habitat, distribution, and phenology. Shrub or small tree collected in forest edges in the municipalities of Abaíra, Ibicoara, Lençóis, Morro do Chapéu, and Mucugê in Central Bahia, at altitudes of 950–1100 m, and in ombrophilous forests in the municipality of Caratinga, Minas Gerais, at altitudes of 400–600 m; flowering material was collected in February, October, and December, and fruiting material in March, May, and December.

Conservation status. This species does not fit presently any of the IUCN criteria for threatened species (IUCN, 2001), considering its wide geographical distribution and occurrence in several distinct environments. Therefore, it can be considered for the moment a taxon of Least Concern (LC) for purposes of conservation.

Affinities. *Myrciaria pilosa* is close to the more widespread *M. floribunda* (H. West ex Willdenow) O. Berg (for description see Amshoff, 1951: 108, or Sobral, 2003: 139), from which it is distinguished by leaves with the abaxial side covered with gray trichomes and flowers densely covered with sericeous white trichomes.

Etymology. The epithet alludes to the presence of trichomes on the abaxial surface of the leaves and on the external surface of the flowers. In most species of *Myrciaria* O. Berg, leaves and especially flowers are consistently glabrous; few species have pilose flowers



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PLANTAS DO BRASIL

MYRTACEAE

Espécie: *Myrciaria*

Localidade: Caratinga-MG. Estação Biológica de Caratinga, mata do Jaó

Data: 01/XII/2001

Coletor: J.V. Gomes 721

Determinador:

Obs.: "Goiabeira" ou "Falsa-pelada". Plot 2

Figure 3. Holotype specimen of *Myrciaria pilosa* Sobral & Couto (Gomes 721, BHCB).

and this character seems to be especially useful in identifying them (Sobral, 1993).

Paratypes. BRAZIL. Bahia: Abaíra, R. Harley, D. Hind, E. Lughadha, V. Souza, C. Sakuragui & W. Ganer 50332 (CEPEC, HUEFS, K, SPF), R. Harley, D. Hind, E. Lughadha, V. Souza, C. Sakuragui & W. Ganer 50471 (CEPEC, HUEFS,

K, SPF); Ibicoara, L. A. Passos & A. R. L. Nogueira 272 (ALCB, CEPEC); Lençóis, I. Koch, M. Lisboa & R. Belinello 686 (BHCB, UEC); Morro do Chapéu, E. Nic Lughadha, F. França, P. Gasson & R. Harley PCD 5995 (ALCB, BHCB), F. França, E. Melo & B. Marques da Silva 2813 (BHCB, HUEFS); Mucugê, F. França, S. Atkins & B. M. da Silva 4169 (BHCB, HUEFS). Minas Gerais: Caratinga, Est. Biol.



Figure 4. Holotype specimen of *Plinia longiacuminata* Sobral (*Carvalho et al.* 6027, CEPEC).

Caratinga, Mata do Jaó, J. V. Gomes 1548 (BHCB), F. Couto 86 (BHCB), F. Couto 191 (BHCB, MO).

Plinia longiacuminata Sobral, sp. nov. TYPE: Brazil. Bahia: Uruçuca, Serra Grande, ca.

7.3 km na estrada Serra Grande–Itacaré, 14 July 1995, A. M. de Carvalho, A. M. Amorim, J. G. Jardim, G. V. F. Pitanga & L. A. V. Carvalho 6027 (holotype, CEPEC; isotype, NY). Figures 1C, 4.

Haec species *Pliniae eduli* (Vellozo) Sobral proxima, sed ramunculis glabris et foliis angustioribus recedit.

Shrub to small tree 2–12 m; twigs gray, glabrous or occasionally with sparse erect brown trichomes 0.1–0.2 mm and sometimes bearing 2 to 5 series of widely to narrowly triangular cataphylls, the proximal ones 1×1 mm and the distal ones to 5×2 – 3 mm. Leaves petiolate; twigs slightly swollen at the insertion of the petioles, these 3 – 5×1 mm, glabrous or with scattered gray trichomes to 0.1 mm, blackened in dried specimens; blades narrowly lanceolate or oblong, 95 – 150×13 – 22 mm, discolored, drying dull green adaxially and slightly light brown abaxially; glandular dots scattered, to 0.1 mm diam., not visible on both sides, faintly visible against light; apex long-acuminate, the tip 15 – 35 mm; base cuneate; midvein plane or slightly impressed adaxially and salient abaxially; secondary veins in 20 to 25 pairs, scarcely visible on either side, occasionally faintly salient abaxially; intramarginal vein 1 – 1.5 mm from the sometimes revolute margin. Inflorescences ramiflorous, with up to 6 flowers, glomeruliform, fertile axis to 2×2 mm; bracts at base of inflorescences triangular, with scattered pale trichomes to 0.1 mm, in 3 to 4 series, the proximal ones 1×1 mm, the distal ones 6×4 mm; bracteoles triangular, to 2×2 mm, with white trichomes to 0.1 mm abaxially. Flower buds not seen; old flowers examined, these glabrous within and bearing white or gray trichomes 0.5–1 mm without; calyx lobes 4 or 5, irregularly triangular, 2 – 4×2.5 – 4 mm; petals not seen; stamens not seen; staminal ring 4 mm diam.; style 7–10 mm; calyx tube 2–2.5 mm deep; ovary 2-locular with 2 ovules per locule. Fruits globose to oblate, pale yellow to brownish yellow when ripe, to 35×45 mm, with persisting calyx lobes, 1-seeded; seeds ellipsoid to reniform, the embryo with 2 distinct plano-convex cotyledons and no evident hypocotyl.

Habitat, distribution, and phenology. Small tree from the coastal forests (mata atlântica) of the state of Bahia; presently it is known only from the municipalities of Una and Uruçuca in southern Bahia. Flowering material was collected in July, and fruiting material in February, April, May, July, and September to December.

Conservation status. The apparently restricted range of this species may be indicative of endemism, and it might be considered for inclusion under the IUCN category Vulnerable (VU) (IUCN, 2001), because it fits the IUCN criteria B2ab(iii), that is, area of occupancy estimated to be less than 20,000 km² (B2), distribution known to no more than 10 locations (B2a), and continuing decline of extent and/or quality of habitat, since coastal forests in

southern Bahia are under constant anthropic pressure due to farming, cocoa plantations, and *Eucalyptus* forestation (B2b(iii)).

Affinities. *Plinia longiacuminata* is apparently related to *P. edulis* (Vellozo) Sobral (for description see Sobral, 2003: 149), another species from coastal Brazilian forests, from which it can be set apart by the characters in the following key couplet:

Etymology. The epithet alludes to the long-acuminate leaves of the species.

Paratypes. BRAZIL. Bahia: Uruçuea, 7.3 km N of Serra Grande, A. M. de Carvalho, W. W. Thomas & T. S. dos Santos 3451 (CEPEC, NY), A. M. Carvalho, W. W. Thomas & T. S. dos Santos 3543 (CEPEC, NY), W. W. Thomas, A. M. de Carvalho, A. Amorim, S. Sant'Ana, J. G. Jardim & J. Gebhards 9166 (CEPEC, NY); 7.4 km N of Serra Grande, W. W. Thomas, J. Pirani, J. Kallunki & L. Cordeiro 10333 (CEPEC, NY), A. M. de Carvalho, W. W. Thomas, T. S. dos Santos, S. C. Sant'Ana & L. A. Mattos Silva 4403 (CEPEC, NY), J. G. Jardim, A. M. de Carvalho, A. M. Amorim & S. C. Sant'Ana 426 (CEPEC, NY). W. W. Thomas, A. M. de Carvalho, J. Jardim & G. Pitanga 11007 (CEPEC, NY); Una, Fazenda São Rafael, L. A. Mattos Silva, J. B. Jordão Jr. & B. R. dos Santos 3890 (CEPEC).

Plinia subavenia Sobral, sp. nov. TYPE: Brazil. Bahia: Una, Res. Biol. do Mico-Leão, divisa da Faz. Maruim com Faz. Dois de Julho, 16 Sep. 1993, S. C. Sant'Ana, A. M. Amorim, J. G. Jardim, E. B. dos Santos & A. G. Neto 365 (holotype, CEPEC; isotypes, MO, RB). Figures 1D, 5.

Haec species *Pliniae involucratae* (O. Berg) McVaugh proxima, a qua ramunculis glabris et venis centralibus adaxialiter sulcatis recedit.

Tree 4–20 m high; twigs pale brown, glabrous or with scattered white trichomes to 0.2 mm. Leaves with petioles 5–6 × 0.7–0.8 mm, glabrous or bearing trichomes as the twigs; blades glabrous or with scattered trichomes on the midvein, elliptic to lanceolate, sometimes oblong-elliptic, 45–70 × 15–20 mm, discolored, dull green adaxially and grayish green or brownish green abaxially, with glandular dots less than 0.1 mm diam., evident abaxially; apex long-acuminate, the acumen 6–18 mm; base cuneate to



Figure 5. Paratype specimen of *Plinia subavenia* Sobral (*Fernandes et al. 2907, BHCB*).

attenuate; midvein sulcate and frequently with scattered white trichomes to 0.1 mm adaxially, salient and rarely with sparse trichomes to 1 mm abaxially; secondary veins in 10 to 16 pairs, scarcely visible adaxially, visible and faintly salient

abaxially; intramarginal vein 0.5–1.5 mm from the markedly revolute margin, occasionally a submarginal vein (sensu Carr et al., 1986: 61) to 0.3 mm. Inflorescences as axillary glomerules, the fertile axes to 1 × 1.5 mm, each bearing 2 to 4 flowers;

bracts hemispheric, 0.8–1 × 1–1.5 mm, with cilia to 0.1 mm; pedicels absent; bracteoles elliptic, 2 × 1.2–1.5 mm, keeled, with trichomes 0.2 mm along the keel. Flower buds not seen; flowers with white trichomes to 0.2 mm on the ovary, the indumentum becoming sparse along the calyx tube and absent on the abaxial side of the calyx lobes, these 4 to 6, 1–2 × 1–2 mm, irregular and partially tearing the 1-mm-deep calyx tube at anthesis; stamens not seen; staminal ring to 2 mm, glabrous; petals not seen; style 5 mm, the stigma punctiform; ovary 2-locular, with 2 ovules per locule. Fruits oblate, yellow when ripe, 9–12 × 14–15 mm, with scattered white trichomes, 1-seeded; seeds ellipsoid, 12 × 7–8 mm; embryo glandular-dotted, with 2 distinct plano-convex cotyledons and no evident hypocotyl.

Habitat, distribution, and phenology. *Plinia subarenia* is a tree from coastal Brazilian forests (mata atlântica), occurring at altitudes from sea level to 900 m; it is presently known from only two localities in Bahia and Espírito Santo, some 700 km apart from each other. Curiously, it has not yet been collected at any site along the 700 km that separate these localities. Flowering material was collected in September and fruiting material in March and September.

Conservation status. *Plinia subarenia* presents a considerably wide geographical distribution, and presently it does not fit any of the necessary IUCN criteria to be included in any of the risk categories (critically endangered, endangered, or vulnerable; IUCN, 2001). Nevertheless, considering its occurrence in the area of the central corridor of the Atlantic forest (Aguiar et al., 2005) and the intense pressure that still exists on forest fragments along this corridor (Aguiar et al., 2005; Young, 2005), this species can be considered in the category of Near Threatened (NT; IUCN 2001), a category for species close to qualifying for a threatened category in the near future, depending on developmental policies in the region.

Affinities. *Plinia subarenia* is apparently related to *P. involucrata* (O. Berg) McVaugh (for a description see McVaugh, 1958: 779 [as *Plinia pinnata* L.] and McVaugh, 1969: 228), an Amazonian species, from which it can be set apart by the following couplet:

- Ia. Branches and petioles villous-tomentose with trichomes to 1 mm; blades with midvein flat or raised adaxially and abaxial face with erect yellow trichomes; bracts to 2.5 mm, bracteoles to 4 mm, silky; flowers entirely pilose externally; fruits with velutinous brown trichomes; Amazonian Brazil, Peru, and Venezuela *Plinia involucrata*
- Ib. Branches and petioles glabrous or with scattered trichomes to 0.2 mm; blades with midvein impressed adaxially and abaxial face glabrous or with

scarce, loosely appressed white trichomes; bracts to 1 mm, bracteoles to 2 mm, with trichomes restricted to the keel; flowers externally pilose only at the ovary; fruits with sparse white trichomes; eastern Brazilian forests . . . *Plinia subarenia*

Etymology. The epithet is derived from the Latin word for almost veinless, alluding to the scarcely visible venation of the leaf blades.

Paratype. BRAZIL. **Espírito Santo:** Santa Teresa, Valsugana Velha, Est. Biol. de Santa Teresa, H. Q. Boudet Fernandes, W. Boone & W. Pizzoloto 2907 (BHCB, MBML).

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